CLAIMS

What is claimed is:

1.   A process for preparing poly(trimethylene terephthalate) fiber comprising (a) providing a poly(trimethylene terephthalate) composition comprising about 0.05 to about 10 weight % ionomer and (b) spinning the polymer composition to form a fiber.

2.   A process for preparing poly(trimethylene dicarboxylate) multifilament yarn comprising (a) providing a polymer blend comprising poly(trimethylene dicarboxylate) and about 0.1 to about 10 weight % ionomer, by weight of the polymer in the polymer blend, (b) spinning the polymer blend to form poly(trimethylene dicarboxylate) multiconstituent filaments containing dispersed ionomer, and (c) processing the multiconstituent filaments into poly(trimethylene dicarboxylate) multifilament yarn comprising poly(trimethylene dicarboxylate) multiconstituent filaments containing ionomer dispersed throughout the filaments.

3.   The process of claim 1 wherein the poly(trimethylene dicarboxylate) is selected from the group consisting of poly(trimethylene arylate)s and mixtures thereof.

4.   The process of claim 1 wherein the poly(trimethylene dicarboxylate) is poly(trimethylene terephthalate).

5.   The process of claim 3 wherein the blend comprises about 90 to about 99.9 weight % of the poly(trimethylene arylate) and about 10 to about 0.1 weight % of the ionomer, by weight of the polymer in the polymer blend.

6.   The process of claim 4 wherein the polymer blend comprises about 70 to about 99.9 weight % of the poly(trimethylene terephthalate), about 5 to about 0.5 weight % of the ionomer, by weight of the polymer in the polymer blend and, optionally, up to 29.5 weight % of other polyesters, by weight of polymer in the polymer blend.

7.   The process of claim 1 wherein the blend comprises about 2 to about 0.5 % ionomer, by weight of the polymer in the polymer blend.

8.   The process of claim 6 wherein the blend comprises about 95 to about 99.5 % of the poly(trimethylene terephthalate) and about 2 to about 0.5 % of the ionomer, by weight of the polymer in the polymer blend.

9.   The process of claim 3 wherein the multiconstituent filaments are poly(trimethylene terephthalate) biconstituent filaments comprised of about 98 to about 99.5 % poly(trimethylene terephthalate) and about 2 to about 0.5 % ionomer, by weight of the polymer in the filaments.

10.   The process of claim 1 wherein the ionomer is selected from the group consisting of E/X/Y copolymers where E is ethylene, X is a softening comonomer such as acrylate or methacrylate present in 0 to about 50 weight percent of the copolymer, and Y is acrylic or methacrylic acid present in about 3 to about 30 weight percent of the copolymer, and wherein the acid moiety is neutralized about 1 to about 90 % to form an ionomer by a cation selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, lead, tin, zinc or aluminum, and combinations thereof.

11.   The process of claim 10 wherein the ionomer is selected from the group consisting of ethylene/acrylic acid, ethylene/methacrylic acid, ethylene/acrylic acid/n-butyl acrylate, ethylene/methacrylic acid/n-butyl acrylate, ethylene/methacrylic acid/iso- butyl acrylate, ethylene/acrylic acid/iso-butyl acrylate, ethylene/methacrylic acid/n-butyl methacrylate, ethylene/acrylic acid/methyl methacrylate, ethylene/acrylic acid/methyl acrylate, ethylene/methacrylic acid/methyl acrylate, ethylene/methacrylic acid/methyl methacrylate, and ethylene/acrylic acid/n-butyl methacrylate copolymers, and mixtures thereof.

12.   The process of claim 11 wherein the ionomer is selected from the group consisting of ethylene/methacrylic acid, ethylene/acrylic acid, ethylene/methacrylic acid/n-butyl acrylate, ethylene/acrylic acid/n-butyl acrylate, ethylene/methacrylic acid/methyl acrylate and ethylene/acrylic acid/methyl acrylate copolymers.

13.   The process of claim 8 wherein the ionomer is selected from the group consisting of E/X/Y copolymers where E is ethylene, X is a softening comonomer such as acrylate or methacrylate present in 0 to about 50 weight percent of the copolymer, and Y is acrylic or methacrylic acid present in about 3 to about 30 weight percent of the copolymer, and wherein the acid moiety is neutralized about 1 to about 90 % to form an ionomer by a cation selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, lead, tin, zinc or aluminum, and combinations thereof.

14.   The process of claim 13 wherein the ionomer is selected from the group consisting of ethylene/methacrylic acid, ethylene/acrylic acid, ethylene/(meth)acrylic acid/n-butyl acrylate, ethylene/(meth)acrylic acid/ethyl acrylate, and ethylene/(meth)acrylic acid/methyl acrylate copolymers.

15.   The process of claim 1 wherein the blend further comprises at least one selected from the group consisting of hexamethylene diamine, polyamides,

delusterants, nucleating agents, heat stabilizers, viscosity boosters, optical brighteners, pigments, and antioxidants.

16. The process of claim 2 wherein the multifilament yarn is partially oriented yarn and the spinning comprises extruding the polymer blend through a spinneret at a spinning speed of at least about 3,000 m/m.

17. The process of claim 2 wherein the multifilament yarns comprise about 0.5 to about 2.5 dpf filaments and are spun at a spinning speed of at least about 2,500 m/m.

18. The process of claim 2 wherein the multifilament yarn is spun drawn yarn and the processing comprises drawing the filaments at a draw speed, as measured at the roller at the end of the draw step, of about 2,000 to about 8,000 m/m.

19. A process for preparing poly(trimethylene terephthalate) multifilament textured yarn comprising poly(trimethylene terephthalate) multiconstituent filaments, comprising (a) preparing a package of partially oriented poly(trimethylene terephthalate) multifilament yarn by the process of claim 17, (b) unwinding the yarn from the package, (c) drawing the multiconstituent filaments yarn to form a drawn yarn, (d) false-twist texturing the drawn yarn to form the textured yarn, and (e) winding the yarn onto a package.

20. A process for preparing poly(trimethylene terephthalate) multifilament textured yarn comprising poly(trimethylene terephthalate) multiconstituent filaments, comprising (a) preparing a package of spun drawn poly(trimethylene terephthalate) multifilament yarn by the process of claim 19, (b) unwinding the yarn from the package, (c) false-twist texturing the yarn to form the textured yarn, and (d) winding the textured yarn onto a package.

21. The process of claim 1 wherein the ionomer is highly dispersed throughout the filaments.

22. The process of claim 1 wherein the ionomer is substantially uniformly dispersed throughout the filaments.

23. A poly(trimethylene terephthalate) fiber comprising poly(trimethylene terephthalate) with about 0.1 to about 10 weight % ionomer dispersed throughout the poly(trimethylene terephthalate).

24. A multicomponent fiber comprising at least one component comprising poly(trimethylene terephthalate) with about 0.1 to about 10 weight % ionomer dispersed throughout the poly(trimethylene terephthalate).

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